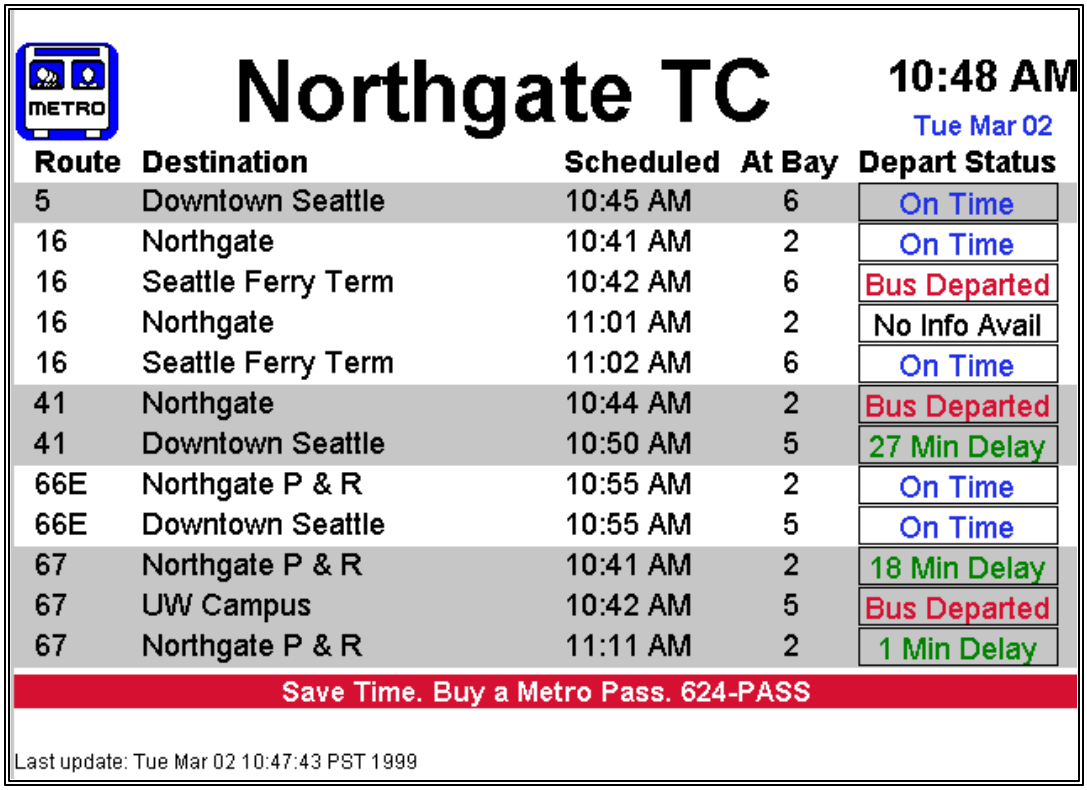
Metropolitan Model Deployment Initiative: Seattle, Washington



Northgate TC 10:48 AM Tue Mar 02

Route	Destination	Scheduled	At Bay	Depart Status
5	Downtown Seattle	10:45 AM	6	On Time
16	Northgate	10:41 AM	2	On Time
16	Seattle Ferry Term	10:42 AM	6	Bus Departed
16	Northgate	11:01 AM	2	No Info Avail
16	Seattle Ferry Term	11:02 AM	6	On Time
41	Northgate	10:44 AM	2	Bus Departed
41	Downtown Seattle	10:50 AM	5	27 Min Delay
66E	Northgate P & R	10:55 AM	2	On Time
66E	Downtown Seattle	10:55 AM	5	On Time
67	Northgate P & R	10:41 AM	2	18 Min Delay
67	UW Campus	10:42 AM	5	Bus Departed
67	Northgate P & R	11:11 AM	2	1 Min Delay

Save Time. Buy a Metro Pass. 624-PASS

Last update: Tue Mar 02 10:47:43 PST 1999

Transit Watch® – Bus Station Video Monitors: Customer Satisfaction Evaluation

U.S. Department of Transportation
Federal Highway Administration

SmartTrek
Get Connected and Go!

January 28, 2000

1. Report No. FHWA-JPO-??-???	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Transit Watch® - Bus Station Video Monitors: Customer Satisfaction Evaluation; Metropolitan Model Deployment Initiative: Seattle, Washington		**5. Report Date** January 28, 2000 **6. Performing Organization Code**
7. Authors Shomik Raj Mehndiratta (CRA), Christopher Cluett (Battelle), Michael Kemp (CRA), Jane Lappin (EG&G/Volpe)		**8. Performing Organization Report No.**
9. Performing Organization Name and Address Battelle Memorial Institute 4500 Sand Point Way N.E., Suite 100 Seattle, WA 98105-3949		**10. Work Unit No. (TRAIS)** **11. Contract or Grant No.** DTFH61-96-C-00077
12. Sponsoring Agency Name and Address United States Department of Transportation ITS Joint Program Office, HVH-1 400 7th Street SW Washington, DC 20590		**13. Type of Report and Period Covered** **14. Sponsoring Agency Code** HVH-1
15. Supplementary Notes Dr. Joseph I. Peters		

16. Abstract

This report presents the results of an evaluation of public use of the King County Department of Transportation's (Metro) bus station video monitors, known as Transit Watch®. This research was sponsored by the US Department of Transportation to assess customer satisfaction with the deployment of Intelligent Transportation Systems (ITS) products and services in selected metropolitan areas under the Federal Highway Administration's Metropolitan Model Deployment Initiative (MMDI) program. This report documents the results of a survey of a representative sample of transit riders at two Transit Centers in the Seattle, Washington metropolitan region. Telephone surveys were conducted between January and March 1999, resulting in a total of 505 completed questionnaires. Additional information about Transit Watch® can be obtained at a web site maintained by the University of Washington, at the following URL: http://www.its.washington.edu/transitwatch/.

This survey had four primary objectives:

- To characterize both the passengers who use the transit center and the Transit Watch® users.
- To analyze the use of the monitors and to explore possible improvements to the monitor-based system and provide guidance in that planning.
- To assess the satisfaction, value and behavioral responses of transit riders based on use of Transit Watch® and access to real-time bus status information.
- To assess the potential influence of Transit Watch® on ridership, particularly rider retention.

This report concludes that Transit Watch® is widely used and found useful by most of the transit riders who pass through either of these two Transit Centers where Transit Watch® had been deployed. While most respondents to the survey found the information displayed about bus schedules and real-time departure status was comprehensive and accurate, they also offered many useful suggestions for improvements to the system. Finally, while Transit Watch® was perceived to be of a real benefit by its users, users did not think that it altered their *overall* satisfaction with their transit experience. However, new frequent riders, who are likely to be most at risk of leaving public transportation when given the opportunity, reported the highest levels of satisfaction with Transit Watch®. It is hoped that increased satisfaction associated with travel information innovations like Transit Watch® can help retain ridership on the bus system.

Key Words	**18. Distribution Statement**
Intelligent Transportation Systems (ITS), Metropolitan Model Deployment Initiative (MMDI), Evaluation, Customer Satisfaction, Transit Watch®, Smart Trek, King County Metro	No restrictions. This document is available to the public from: The National Technical Information Service, Springfield, VA 22161.

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21.No of Pages	22. Price
Unclassified	Unclassified	32	N/A

Acknowledgements

This report was prepared under contract with the US Federal Highway Administration as a part of the Customer Satisfaction evaluation of the Metropolitan Model Deployment Initiative, under the direction of Dr. Joseph Peters, FHWA Joint Program Office. The authors would like to acknowledge the contributions of Jan Leonard (Battelle Seattle) and her team of interviewers who braved inclement weather to interview bus riders; Betsy Payn, Linda Winges and Susan Pearce who processed the data (Battelle Seattle); Diane Burkom and her survey research team (Battelle Baltimore); Sean Peirce (Charles River Assoc.); Lisa D'Ambrosio (Volpe Center); Robert Wade and Tom Friedman (King County Metro); Catherine Bradshaw (TRAC); and Peter Briglia (WSDOT).

Table of Contents

EXECUTIVE SUMMARY....1
Findings from the Seattle Region Transit Watch® Evaluation Survey....1
INTRODUCTION....4
WHO IS THE SAMPLE?....4
HOW MANY PEOPLE ARE AWARE OF AND USE THE MONITORS?....5
WHO ARE THE REGULAR USERS OF TRANSIT WATCH®?....6
Demographics: Younger, more educated, and more technologically savvy....6
Travel behavior characteristics of Transit Watch® users....6
Attitudes: Users are more likely to be *impatient* and to exhibit information-seeking behavior....7
AWARENESS AND USE: DEPARTURE TIMES ARE MOST OFTEN SOUGHT, THOUGH OTHER INFORMATION IS ALSO USED....9
ASSESSMENT OF TRANSIT WATCH®....9
BENEFITS OF TRANSIT WATCH®....10
Findings from attitudinal responses: Only slightly, but *definitely* better transit experience....10
The benefits are manifested in a wide variety of behavioral responses....11
Transit Watch® and Safety Considerations....12
Transit Watch® and Ridership....13
SUGGESTIONS FOR IMPROVEMENT....15
CONCLUSIONS AND RECOMMENDATIONS....15
APPENDIX A: Transit Watch® CATI Survey Questionnaire....A-1

EXECUTIVE SUMMARY

Findings from the Seattle Region Transit Watch â Evaluation Survey

This report documents the results of a survey of a representative sample of transit riders at two Transit Centers in the Seattle metropolitan region. The centers had been equipped with Transit Watch® video monitors for several months prior to the survey. In general, our survey results indicate that:

- Transit Watch® (TW) is both widely used and useful. Actual bus departure times are the TW feature found most useful by the users.

- Real-time information at locations where key travel decision are made (e.g., office buildings) would be used and considered useful by a majority of transit passengers. Transit Watch® users particularly endorsed this suggestion.

- The content, location, accuracy, and presentation of the current TW monitors are satisfactory for most transit riders who use them, though many also offered suggestions for improvements.

- Although TW and the improved information *is* perceived as a real benefit by its users, overall the users did not seem to think that it increased their *overall* satisfaction with the transit experience. Our analysis indicates that TW in and of itself is unlikely to significantly change aggregate transit trends and perceptions. However, new frequent riders, who are likely to be most at risk of leaving public transportation when given the opportunity, reported the highest levels of satisfaction with Transit Watch®, and Transit Watch® has made them more satisfied with their decision to take the bus. It is hoped that increased satisfaction associated with travel information innovations like Transit Watch® can help retain ridership on the bus system.

Our respondents were representative of people using these two Transit Centers, but we cannot generalize from the experiences of riders at these centers to all riders or locations in the King County Metro system. Three out of every four respondents were aware of Transit Watch®. About 22% of the entire sample stated that they *always* use TW. About another one in four (28%) said that they use it sometimes, 26% said that they rarely use Transit Watch®, and 25% said they had never seen the monitors.[1]

[1] The user group, composed of regular and occasional users of Transit Watch, comprises 50% of the sample, and the balance of the respondents are combined into a non-user group for this analysis. Percentages may not sum to 100 percent due to rounding.

The regular users – who said that they always use TW – are slightly younger, slightly more educated (though not statistically significant), and slightly more technologically savvy than the non-users. There is no significant difference in the incomes of TW users and non-users. Regular and occasional TW users are likely to use the bus system somewhat more intensively and for a greater variety of purposes than the non-users.

Relative to non-users, TW users are more likely to be impatient and exhibit information-seeking behaviors. Our analyses also suggest that as a group, regular TW users are more likely to say they will switch modes if given the opportunity and means, though they also are more likely to use the TW monitors. Given that TW monitor use is associated with greater satisfaction and comfort, this offers some basis for optimism for retaining ridership.

A majority of the respondents were long-term users of the bus service, and most of them (TW users and non-users alike) indicated a high awareness of bus schedules. Our analyses indicate that providing *actual bus departure times* is the Transit Watch® feature found most useful by the users. The scheduled departure times and route number descriptions also seem to be useful. As it is presently used, the red Metro service messages displayed at the bottom of the TW monitors do not appear to be perceived as useful by respondents.

In general, users seem to be satisfied with the content, accuracy, presentation, and location of Transit Watch® information. Although half the respondents have no suggestions for improvement, improved accuracy is mentioned most often among desired improvements.

Our analyses suggest that both regular and occasional TW users view Transit Watch® as a *real benefit* – more than a cosmetic addition to the Transit Centers. However, the responses also suggest that although Transit Watch® seems to provide a variety of benefits to many users – some peace of mind and some flexibility – it does not significantly increase their satisfaction with their decision to use the bus.

Use of Transit Watch® has a measurable effect on the comfort and satisfaction of new riders with the transit experience, and this has the potential to help retain ridership. While we can't really say with this early study and these data whether a decision to implement Transit Watch® at many other transit centers in the Metro system will retain more riders, increase their intensity of use of transit, or perhaps even attract new riders to the system, we can say that Transit Watch® has had a positive effect on selected groups of transit riders who are traditionally more difficult to attract and retain. New frequent transit riders report the most satisfaction with their decision to take the bus since the introduction of TW. There is also some evidence here that some of these new riders are inclined to stay with transit, even when they do have options.

The analyses also indicate that Transit Watch® information has the potential to address safety-related concerns, although such concerns were minimal among the respondents of the present survey.

Finally, based on the survey responses, apart from more video monitors at major bus stops, the most worthwhile information-related investments seem to be *Internet websites* that consumers could check before leaving work or home, and video monitors at *malls or office buildings close to major bus stops* that would allow consumers to maximize the time spent at their trip origins or destinations.

INTRODUCTION

This document presents the results of a survey of *Transit Watch â* users. Transit Watch® is a video monitor providing transit information at two transit centers in the Seattle metropolitan region: Northgate and Bellevue. The video monitors were installed in mid-1998 as part of the Smart Trek Metropolitan Model Deployment Initiative (MMDI), a federally funded ITS program. The monitors provide information about the bay number at which the bus will arrive, the scheduled times of arrival and departure, and the expected *actual* departure times for all of the bus routes using the transfer centers. Actual times are based on information obtained from an Automated Vehicle Location system.

The survey documented in this report was carried out as part of the MMDI evaluation of Smart Trek MMDI programs. Respondents for the Transit Watch® survey were initially intercepted in January 1999 at both the Bellevue Transit Center and the Northgate Transit Center. When recruited, respondents gave their names and phone numbers to representatives of the survey team, who followed up with a phone call and telephone survey questionnaire (see CATI version of questionnaire in Appendix A). Telephone interviews were conducted between January and March 1999, resulting in a total of 505 completed questionnaires.

This survey had four primary objectives:

- To characterize both the passengers who use the transit center and the Transit Watch® users.
- To analyze the use of the monitors and to explore possible improvements to the monitor-based system and provide guidance in that planning.
- To assess the satisfaction, value and behavioral responses of transit riders based on use of Transit Watch® and access to real-time bus status information.
- To assess the potential influence of Transit Watch® on ridership, particularly rider retention.

WHO IS THE SAMPLE?

The sample was composed of randomly selected respondents so that the results represent the entire population of transit riders at these two transit centers. Percentages in the text reflect weighted data based on this sample design. However, we cannot generalize from the experiences of riders at these centers to all riders or locations in the King County Metro system.

- Most transit riders at these two transit centers are regular, long-term users of the bus service. Seventy-seven percent of the respondents indicated that they had been using the bus service for longer than a year, and less than 7% indicated that they had started using bus services within the last three months. Further, just over 60% of the respondents stated that they use the bus for at least a substantial proportion of all their trips.

- Over 90% of the respondents also stated that they use one of these two Transit Centers (TC) at least once a week. On average, the respondents use the TCs between 4 and 5 times a week. Though the centers are popular *transfer* stations – two thirds of the respondents reported transferring buses at the TC in the last month – they are also popular origins/destinations. About half the respondents indicated that they had started or ended their journeys at a TC in the last month.

- The respondents seem to use the TC extensively throughout the day on weekdays until 7 PM. Reported usage was much lower after 7 PM and on weekends. Reported use of the bus service among the respondents was lowest on Sundays.

HOW MANY PEOPLE ARE AWARE OF AND USE THE MONITORS?

- Twenty-two percent of our sample said that they "always" use the TW monitors. They are referred to as our regular users.

- Another 28% said they "sometimes" use the monitors. On average these users said they look at the TW monitors between 6 and 7 times a week.

- About 26% of the sample said they are aware of the TW monitors, but rarely or never use them.

- About 25% of the sample stated that they are unaware of the monitors.

Thus, the user group comprises 50% of the sample (the first two categories above), and the balance of the respondents are combined into a non-user group for this analysis.

WHO ARE THE REGULAR USERS OF TRANSIT WATCHâ?

Demographics: Younger, more educated, and more technologically savvy

- The regular user segment is somewhat *younger* than the segment of non-users, and the occasional users were in between.[2] Users are more likely to be aged 35 or younger, and those who are aged 56 or older are much more likely to say they had never seen the TW monitors. In general the regular users are younger than average for the region's population: 59% of the users stated that they were less than 35 years of age, and 78% stated that they were less than 45 years of age.[3]

- The entire sample had a higher proportion of females than males (54% vs. 46%), and males were *slightly* more likely to say they always check the monitors; however, females are much more likely to say they never saw the TW monitors.

- The regular users seem to be *slightly* more educated than non-users, though this difference is *not* statistically significant. Eighty-six percent of the regular TW users reported having at least some college education (compared to 78% for the non-users and 83% for the occasional users) and 50% have at least four years of college compared to 44% of the non-users.

- On the whole, both regular and occasional users tend to be more "wired" than the non-users: about 82% of them use a computer at work or school once a week; 70% use the Internet at work or school once a week; and 72% use a home computer once a week. The corresponding figures for the non-users are 70%, 54%, and 53%, respectively. All these differences are statistically significant at the 99% confidence level.

- There is no discernible difference between the 1998 household incomes reported by the regular users, occasional users and the non-users. Average 1998 household income for the sample was about $53,000.

Travel behavior characteristics of Transit Watchâ users

- Regular Transit Watch® users are slightly more likely than non-users to be relatively new users of the bus system. Twenty-nine percent of the regular users stated that they had started using the bus in the last 12 months, compared to 21% of the non-users (and 23% of the occasional users). However, this difference is not statistically significant. On the

[2] These results are statistically significant at the 99% confidence level. This means that we can be confident (with a very small chance of error) that the differences observed in the sample reflect true differences in the population of transit riders at these two transit centers.

[3] Based on the 1990 U.S. Census, 54% of the Seattle-Tacoma Metropolitan Statistical Area population in 1990 was under 35 years of age, and 71% were less than 45 years of age.

whole the sample is predominantly composed of long-term users: about 77% of the sample stated that they had been using the bus service longer than a year.

- Both the regular and occasional TW users are *more intensive* riders of the bus service: 44% of the regular TW users (and 37% of the occasional users) stated that they use the bus for all vehicular trips, compared to only 27% of the non-users. Regular users were also slightly more likely to use the bus for non-work trips, e.g., shopping, entertainment activities, and personal business. However, the users were no different from the non-users in the number of reported weekly boardings at the Transit Center (where they were surveyed): about 4.5 boardings a week (though the occasional users reported 5.2 boardings a week). Correspondingly, TW users spend about the same on monthly bus fares as the rest of the sample.

- Similar to the sample as a whole, half of the TW users stated that they had little or no flexibility with their commute time. About 21% of regular TW users (17% of the occasional users and 21% of the non-users) had unlimited flexibility in their commute times. This is slightly lower than estimates from the general population of commuters in the Seattle metropolitan region. Estimates for the representative sample of the general population were obtained from the PSRC travel diary panel survey conducted in 1997. The results of this survey indicate that about one-fourth of commuters in the Seattle metropolitan region state that they have unlimited flexibility in scheduling their work times.[4]

- The whole sample – regular TW users, occasional users, and non-users –indicated a high awareness of the bus schedule. Between 76% (non-users) and 85% (occasional users) of respondents in each segment claimed to know at least the approximate schedule. Very few respondents (in any of the three segments) agreed with the statement, "Because I don't know the schedule, I often need to wait a while."

Attitudes: Users are more likely to be *impatient* and to exhibit information-seeking behavior

All of the respondents were asked a battery of questions designed to elicit information about their attitudes – questions relating mostly to travel, information seeking, and technology use behavior. The responses to this battery of attitudinal questions indicate that:

- As a group, regular TW users in our sample are *more likely to value and seek information* than the sample as a whole. They responded with stronger endorsements (significant statistically) than non-users of statements such as "I feel safer knowing when my next bus

[4] Shomik Mehndiratta, Michael Kemp, Jane Lappin and Eric Nierenberg. 2000. "Likely users of Advanced Traveler Information Systems: Evidence from the Seattle Region." *Transportation Research Record No. 1739: Evaluating Intelligent Transportation Systems, Advanced Traveler Information Systems, and Other Artificial Intelligence Applications.* Transportation Research Board.

will arrive," and "Even if I cannot do anything about it, I'm more comfortable if I'm kept informed about bus service delays."

- In the same spirit, both the regular and occasional TW users also responded with a significantly higher endorsements of the statement, "It is important that other people are able to contact me pretty much all the time," than did non-users. Indeed, non-users as a group *did not agree* with this statement, while regular and occasional TW users *did* agree with it on average.

- Another indication of the TW users' value for information is their valuation of bus schedule status information, despite generally sharing a perception with the sample as a whole that the bus service was in fact quite reliable and frequent. As a group, the TW users (both the occasional and regular users) disagreed with the statement, "The bus service is so reliable that it does not matter much to have information about buses running late." The non-users weakly endorsed it. The TW users – both the regular and occasional users – expressed a more critical opinion of the bus service's on-time performance than the non-users. Half of the non-users said they thought the buses were off schedule to some degree; whereas, 72% of the regular TW users said this, though 41% of the regular users said this occurred occasionally and the rest said it happened often or almost always. Transit riders whose value of time is high are more likely to be sensitive to schedule and to value the benefits of Transit Watch®.

- Our analysis also indicates that the regular TW users as a group are more likely than non-users to endorse the statement, "As soon as I can, I'd like to switch to driving."[5] Occasional users were closer to non-users and as a group did not agree with this statement. We examine the important relationship between Transit Watch® use and the likelihood that users will continue to ride transit, and possibly ride more, in a later section of this report.

- The regular TW users are more likely than the non-users to endorse the statement: "I'm comfortable using high-tech information at home or at work." The responses of occasional TW users were in between those of the non-users and regular users, and statistically indistinguishable from either. Unlike the occasional users and non-users (who disagreed), regular TW users also weakly endorsed the statement, "I always keep up with the latest trends" (though the difference was not statistically significant across the three segments).

- There is also some weak evidence suggesting that regular Transit Watch® users are more likely to have *higher expectations of their travel experiences*. Relative to the non-users, they responded with stronger endorsements of statements such as "I get annoyed easily when my travel is delayed." These differences, however, were not statistically significant.

[5] When asked about access to a private vehicle, the group of regular TW users indicated the same level of access as non-users and occasional users: about 40% of each group stated that they had no access to a private vehicle; the rest had at least occasional access.

AWARENESS AND USE: DEPARTURE TIMES ARE MOST OFTEN SOUGHT, THOUGH OTHER INFORMATION IS ALSO USED

- Half of all respondents who said they had seen the TW monitors said they first noticed the monitors within the previous 3 months, and 71% indicated that they had first noticed the monitors within the previous 6 months. Regular users showed the same pattern as the sample as a whole.

- When asked what one TW feature they would be *most likely* to check, slightly more than half of the TW users stated that they were *most likely* to check *actual* bus departure times (55% of the regular users and 58% of the occasional users). Between 23% of the occasional users and 30% of the regular users stated that they were most likely to check scheduled departure times. In addition:

  – About 40% of the users (46% of the regular users and 32% of the occasional TW users) indicated that they had used the monitors at least once to determine which *route* they needed to take.

  – Slightly fewer users (about 29% overall, including 35% of the regular users and 24% of the occasional users) indicated that they had ever used the monitors to find out which *bay* their bus arrived at.

  – In general, as would be expected, the more intensive regular TW users seem to use the Transit Watch® monitors for a greater variety of reasons than do occasional users.

ASSESSMENT OF TRANSIT WATCH®

- In general, both the regular and occasional TW users had similar impressions of Transit Watch®. About 80% of both groups indicated that they felt that the monitors are accurate all or most of the time.

- Over three-quarters of the regular users indicated that information about actual and scheduled departure times, and the description of different route numbers was "very useful." The occasional users were slightly less enthusiastic though most agreed with the regular users in describing these features to be at least "somewhat useful."

- There is no consensus across the TW users on the usefulness of "bay number" information, i.e., directing passengers to the bay that buses are expected to arrive at. Slightly less than one third of the users (31%) thought that such information was very useful. However, about an equal number thought that it was "not at all useful," with the remainder (also a third) stating that it was "somewhat useful."

- There was a clear consensus among respondents – both regular users (78%) and the occasional users (89%) – that the red message was "not at all useful."

- Eighty-six percent of the users thought that the screen was very readable at close proximity, and over 90% thought that the locations of the screens were acceptable ("good" or "OK"). There was no difference between the views of regular and occasional users on these issues. About two-thirds of the respondents thought that the screens were adequately readable from a distance and just more than half shared the same feeling about monitor readability in crowds. However, the occasional users were slightly more critical of screen readability in a crowd: about 49% of the occasional users thought that readability was "poor" in a crowd compared to 36% of the regular users (though this difference is not statistically significant).

BENEFITS OF TRANSIT WATCH®

The survey allowed us to gauge the benefits of Transit Watch® in a number of ways. First, some of the attitudinal questions probed respondents about their satisfaction with their general transit experience and how it had changed in the last six months (the period since the installation of the monitors). Second, the survey directly queried users for the effect Transit Watch® had on their peace of mind. Finally, respondents were asked about their behavioral response to Transit Watch® information. We present the main findings from these analyses in this section.

Findings from attitudinal responses: Only slightly, but *definitely* better transit experience

- The responses to the attitudinal questions suggest that TW users – particularly the regular users – *do derive benefits from Transit Watch®*. Both the regular and occasional users disagreed with the statement that "the new video monitors are just cosmetic – what we really need is better transit service." The segment of non-users weakly endorsed this statement. As would be expected, regular users of TW indicated a stronger level of disagreement with this statement than the occasional users, and both groups differed from the views of the non-users. These differences are statistically significant. In addition:

  - TW users – both regular and occasional users – were more likely than the non-users to state that they used buses more than they did six months ago.

  - Though all three segments generally disagreed with the statement that "buses have been less reliable since the new video monitors went in," TW users registered a significantly higher extent of disagreement. As was noted earlier, the TW users are also significantly more likely than the non-users to say that the buses often seem to be off schedule, and, we believe, more likely to be time-sensitive than others.

  - Both the sample of users and the sample as a whole disagreed with the statement, "I seem to spend more time waiting for buses these days than I did six months ago."

- The regular TW users were more likely to endorse the statement that "since the new video monitors went in, my waiting time at the Transit Center has been reduced." Both occasional users and non-users of Transit Watch® were mixed on their opinions regarding this statement.

- The regular users of Transit Watch® were somewhat more likely than non-users to express satisfaction with their decision to take the bus. In the sample as a whole, 60% of the respondents disagreed and 31% agreed (the rest neutral) with the statement, "Introducing the video monitors has made me more satisfied with my decision to take the bus." In the sub-sample of regular TW users, 34% agreed and 51% disagreed (the rest neutral).

  - Although 51% of all respondents agreed (somewhat or strongly) that they "use buses more than they did six months ago," when Transit Watch® users were asked directly, an overwhelming majority (90%) said that they had *not* changed the number of trips (either more or less) that they took by bus as a result of the information provided by the video monitors. However, the few who said they did change the number of trips by bus said they were much more likely to take *more* trips by bus rather than fewer.

The benefits are manifested in a wide variety of behavioral responses

The survey asked users about their reactions to learning about cancelled or delayed bus service (over five minutes) from TW. Users were also prompted for a wide range of possible behavioral responses and asked if they had ever reacted to late/cancelled bus information from Transit Watch® with each of those responses. The analysis of the responses to these questions suggests that:

- About three-quarters of the users of Transit Watch® recalled at least one occasion when the TW video monitors informed them of serious delays (more than 5 minutes). Most of the respondents indicated that at least some of the time they had responded to such information by just waiting for the next bus on the same route. However, 40% of these respondents agreed that in such situations, the information from the video monitors made them *less worried*.

- Moreover, a significant number of users indicated that they had responded to cancelled or late bus information provided by the video monitors by:

  - Calling ahead to let people know that they might be late (about 40% of both regular and occasional users)

  - Taking a different bus to the same destination (63% of both regular and occasional users)

  - Taking a bus to a different destination (35% of the regular TW users, 26% of the occasional users)

- Using a different mode of transport (24% of the regular TW users and 14% of the occasional TW users)

- Leaving the Transit Center and returning later (about 40% of both the regular and occasional TW users)

- Users were also asked about their responses to cancelled or late bus information obtained in the time before TW was installed (usually from Metro employees). Comparing those responses to their stated post-TW responses suggests that at the very least, the TW video monitors have encouraged regular TW users to *change destinations*, and *leave the Transit Center to return* later, more than they did before TW was installed.

Transit Watch® and Safety Considerations

An important goal of both the Transit Watch® project and this evaluation was to gauge the impact of the TW monitors on transit customers' perception of safety at the Transit Centers. Three questions in the attitudinal battery were explicitly designed to understand the safety-related impacts of the TW monitors. Our results indicate that:

- Personal safety at the Transit Centers was not a significant concern for our respondents. Perhaps reflecting the relatively up-market locations of the Bellevue and Northgate Transit Centers, about two-thirds of our respondents somewhat or strongly disagreed with the statement, "I am concerned about my personal safety while waiting at the Transit Center." There were no significant differences in attitudes regarding safety concerns at these transit centers by whether or not the respondent was a Transit Watch® user.

- Correspondingly, respondents were generally indifferent (neither agreeing nor disagreeing) in their responses to the statement, "Because I know when the bus will arrive, I sometimes wait at a safer spot in the Transit Center than at the departure bay." Indeed, both the regular and occasional TW users actually *disagreed* with this statement, while the non-users weakly endorsed it.

- However, our analysis also indicated that Transit Watch® might have a safety-related role to play in environments in which personal security is a more significant issue. All the TW user groups expressed agreement with the statement, "I feel safer knowing when the next bus will leave." Moreover, the TW users responded with a significantly stronger (statistically) endorsement than non-users. As expected, occasional users lay between regular users and non-users in their enthusiasm.

Transit Watch® and Ridership

New ITS services, such as Transit Watch® and BusView,[6] offer transit riders real-time bus status information enabling them to make informed decisions about the time they depart for the bus stop, their route, and whether to forgo a trip or select a different mode of transportation. This additional level of control is expected to make current transit customers more satisfied with their transit experience, and to attract and retain new or marginal transit customers to the system.

This evaluation is limited in its ability to address the question of the effect of the TW monitors on ridership. The survey was conducted at only two Transit Centers early in the initial deployment of the monitors. We cannot assess the response of non-riders and the likelihood that they might decide to use transit as a result of the monitors. Also, bus information, such as that provided by Transit Watch®, is only one factor out of many that can impact ridership.[7]

Several groups of transit riders might be logical targets of ridership retention efforts. These include: 1) persons who have recently become transit riders; 2) persons who ride the bus infrequently; and, 3) persons who are not dependent on transit to get where they want to go but choose to ride the bus anyway.[8] We looked at these rider segments to see whether TW use was related to several indicators of satisfaction with transit, including: 1) "I'm more comfortable if I'm kept informed about bus service delays;" 2) "As soon as I can, I'd like to switch to driving;" and, 3) "Introducing the video monitors at the Transit Center has made me more satisfied with my decision to take the bus."

- Most of the transit users in this sample are long-time riders, many of whom have few alternative options for their travel. A large portion of our sample (77%) have been using transit for more than a year. A little over half of them (56%) say they have a private vehicle available to them for their personal use; whereas, 90% of the new infrequent riders and 65% of the new frequent riders have access to a vehicle. The less dependent a rider is on transit, the more difficult that rider may be to retain, thus the new infrequent users and the new frequent users may be the most difficult groups to retain. However, the new *frequent* riders were more likely to report using Transit Watch® and using Transit Watch® every time they

[6] BusView provides information over the Internet on the location of individual buses on their routes. While this is currently available to King County Metro transit riders who have Internet access, it was not evaluated as part of the MMDI program.

[7] See Charles River Associates, *Trends in Single Occupant Vehicle Miles and Miles of Travel Growth in the United States,* Final Report, 1998, published as "Web Document 5" by the Transit Cooperative Research Program and available at the National Academy Press web site at www.nap.edu. This article includes a discussion of the determinants of transit ridership and the role that policy can play to influence ridership. Also, see Northwest Research Group, Inc., *1998 Rider / Nonrider Survey*, a report prepared for the King County Department of Transportation, Transit Division. This report identifies several key factors affecting ridership, including direct service to riders' destinations, more direct runs without a need to transfer, and service frequency, especially to work sites.

[8] The first two groups of riders are examined using a variable that combines frequency of use with how recently the respondent started using transit. Three categories were defined – long-time users (more than one year), new frequent users, and new infrequent users. The third group of riders is defined as those who have access to a car all or some of the time.

catch a bus than either the new *infrequent* users or the long-time users. In fact, over half of the new *infrequent* riders said they had never seen the TW monitors. Those who have a car available anytime are *less* likely than those who sometimes have a car and those who never have a car available to report using Transit Watch®. Whether the user has a car available to them is not associated with *frequency* of using Transit Watch®.

- New infrequent and frequent riders are more likely to agree (compared with the long-time users) that they feel more comfortable if kept informed about bus service delays. Most respondents agree with this statement (89% overall), but of those who are users of Transit Watch®, 95% agree, regardless of whether or not they say they have alternative transportation available to them or whether they are a new infrequent user, new frequent user, or long-term user.

- Both new infrequent and frequent riders are more likely to agree (compared with the long-time users) that the TW monitors have made them more satisfied with their decision to take the bus. Satisfaction with their decision to take the bus due to the TW monitors is also greater for women and those who don't have ready access to a car.

- Transit riders who do not have a car available to them are more likely to say they will switch to a car when they can. Those who always have a car accessible are much less likely to say they want to switch, presumably because they are taking transit by choice. Those who don't have a car or sometimes have a car available are more likely than those who always have a car available to also say they are satisfied with their decision to take the bus because of the introduction of Transit Watch®. Those who say they will switch away from transit as soon as they can are largely those who are significantly more likely to be experiencing benefits from Transit Watch®. They are more likely to say they are more comfortable if kept informed about bus delays and are more satisfied with their decision to ride the bus.

- The new frequent users of transit tend to be in the younger age categories, and the younger riders are more likely to use Transit Watch® than the rest of the sample (65% of the riders under 36 years are TW users compared to 43% for riders 36 and over). These younger riders are more likely to say they will switch to a car when they can, but significantly more likely to say that, as a result of Transit Watch®, they are satisfied with their decision to take the bus.

This analysis suggests that use of Transit Watch® does have a measurable effect on the comfort and satisfaction of new riders with the transit experience. While we can't really say with this early study and these data whether a decision to implement Transit Watch® at many other transit centers in the Metro system will retain more riders, increase their intensity of use of transit, or perhaps even attract new riders to the system, we can say that Transit Watch® has had a positive effect on selected groups of transit riders who are traditionally more difficult to attract and retain. New frequent transit riders report the most satisfaction with their decision to take the bus since the introduction of TW. There is also some evidence here that some of these new riders are inclined to stay with transit, even when they do have options.

SUGGESTIONS FOR IMPROVEMENT

- Although almost half of the aware respondents (as well as the regular and occasional user segments) stated that they had no suggestions for improvements to the Transit Watch® monitors, those who did mentioned *improved accuracy* the most often.

- All of the respondents in the sample were presented with a series of options for getting real-time bus departure time information and asked if they thought that such information would be useful. Respondents were also asked to rank and identify the three information sources they thought were most useful. In general, the regular Transit Watch® users were slightly more receptive than occasional users (and both user groups were more enthusiastic than the non-users) to all the different sources of information presented to them. We found that:

  - 71% of the regular TW users (and 63% of the occasional users and 49% of the non-users) said that video monitors that provided bus departure time information in nearby shopping malls and the lobbies of major buildings would be useful.

  - About half (55% of the regular TW users, 50% of the occasional users, and 59% of the non-users) said that having a large changeable sign outside the Transit Centers that could be read from the street would be useful.

  - 70% of both the regular and occasional TW users (and 55% of the non-users) said more monitors at Transit Centers would be useful.

  - About two-thirds of the regular TW users (as well as 55% of the occasional users and 45% of the non-users) said an Internet website providing bus departure information would be useful. Phone lines providing this information were slightly less popular.

  - There was relatively little support for "push" e-mail services that automatically alert riders when their bus will be more than five minutes late. Twenty-seven percent of the sample endorsed this option as useful with little difference between users and non-users of the TW monitors. Persons with Internet access at home or work were somewhat more likely to support this option.

- When asked to rank the most useful (worthwhile) source, both regular and occasional TW users ranked more video monitors as their *top* choice for an additional information source. Other popular choices were the changeable message sign, an Internet website, and video monitors in malls.

CONCLUSIONS AND RECOMMENDATIONS

Transit Watch® is widely used and useful. Our analysis suggests that over half of the sample uses TW regularly or occasionally. The respondents disagreed with a statement that the TW

monitors were cosmetic; Transit Watch®, and the information it provides are generally seen as useful. *Actual* departure time information was widely cited as the most useful information provided by the TW monitors, though the respondents strongly endorsed (and used) the scheduled bus departure time and route description information. In general, the users expressed satisfaction with the content and quality of TW information.

Although TW and the improved information *is* perceived as a real benefit by its users, users did not seem to think that it increased their *overall* satisfaction with the transit experience. While Transit Watch® seems to provide a variety of benefits – some peace of mind, greater control, and some flexibility – it is unlikely, in and of itself, to significantly change aggregate transit use levels or perceptions of (satisfaction with) transit in the aggregate. Nevertheless, the high levels of consumer satisfaction with TW, and the extensive use that our analyses indicate that the monitors get, suggest that:

- Improvements in the quality of and access to information is fast becoming an essential element of the basic package of services consumers expect from any service in the so-called "knowledge" economy. This is likely to be especially true of the newest segment of transit riders, those recent entrants into the job market who have grown up with increased access to the Internet and other "instant access" information venues.

- TW (and other initiatives that provide transit riders easy access to real-time transit information in general) may be a worthwhile, and cost-effective, investment relative to the gamut of other investments – increased frequency, newer equipment, etc. – that transit agencies usually consider.

Real-time information at locations where key travel decisions are made would be used and considered useful by a majority of transit passengers. Consumers expressed interest in a variety of forms other than TW monitors that would allow them access to real-time traffic information. The responses indicate that easy access to real-time information provided at *key decision points* would be useful. Consumer also suggested installation of TW-type video monitors at major bus stops. However, this finding may just reflect the important role of hands-on experience in framing consumer perceptions. Apart from video monitors at major bus stops, the most worthwhile information related investments seemed to be:

- *Internet websites* that consumers could check before leaving work or home; and

- Video monitors at *malls or office buildings close to major bus stops* that would allow consumers to maximize the time spent at their trip ends.

The content, location, accuracy, and presentation of the current TW monitors is satisfactory. In general, consumers seem satisfied with the detailed physical design and the content of the Transit Watch® monitors. About half the respondents had no suggestions for improvements the Transit Watch® monitors. Of the improvements suggested, *increased accuracy* was cited most often.

Use of Transit Watch® does have a measurable effect on the comfort and satisfaction of new riders with the transit experience, and this has the potential to help retain ridership. While we can't really say with this early study and these data whether a decision to implement Transit Watch® at many other transit centers in the Metro system will retain more riders, increase their intensity of use of transit, or perhaps even attract new riders to the system, we can say that Transit Watch® has had a positive effect on selected groups of transit riders who are traditionally more difficult to attract and retain. New frequent transit riders report the most satisfaction with their decision to take the bus since the introduction of TW. There is also some evidence here that some of these new riders are inclined to stay with transit, even when they do have options.

Appendix A

Transit Watch® CATI Survey Questionnaire

SCRIPT FOR CALL ON 1-800#:

Thanks for calling us on our toll-free number and agreeing to be interviewed about your travel on Seattle King County Metro. Our goal is to provide information to the transportation agencies in the area to help them improve services, so your answers are very important.

In order to determine the number of calls we receive and prevent duplication, I need your first name and your telephone number.

FIRST NAME: _____

PHONE.....(___) - ___ - ____

Before we begin, let me assure you the information you provide is confidential, and for quality assurance purposes this conversation may be monitored. BEGIN INTERVIEW WITH A1.

SCRIPT FOR ALL OTHERS:

Hello, my name is _____ and I'm calling on behalf of Smart Trek a new information program for travelers in this region. You may recall you recently gave your name and number to one of our recruiters at the _____ Transit Center. Our goal is to collect information in order to help the transportation agencies in the area improve services, so your answers are very important. Before we begin, let me advise you your answers are confidential, and for quality assurance purposes this conversation may be monitored.

BEGIN INTERVIEW WITH B1.

SECTION A: INTRODUCTION

A1. First I need to ask you a little about when and where you found out about this survey. I understand that you were given a leaflet when you were using one of the Transit Centers. Could you tell me which Transit Center you were at when you received a leaflet?

NORTHGATE TRANSIT CENTER.....1
BELLEVUE TRANSIT CENTER.....2

A2. What day of the week was that?

TUESDAY 01
WEDNESDAY.....02
FRIDAY.....03
SATURDAY.....04
UNSURE, BUT A WEEKDAY EARLY IN THE WEEK.....05
UNSURE, BUT A WEEKDAY LATE IN THE WEEK 06
UNSURE, BUT A WEEKDAY.....07
DK/CAN'T SAY.....99

A3. Do you recall approximately what time of day that was?

6:00-6:59 a.m. 01
7:00-7:59 a.m. 02
8:00 – 8:59 a.m. 03
9:00 – 9:59 a.m. 04
10:00 – 10:59 a.m. 05
11:00 – 11:59 a.m. 06
12:00 – 12:59 p.m. 07
1:00 – 1:59 p.m. 08
2:00 – 2:59 p.m. 09
3:00 – 3:59 p.m. 10
4:00 – 4:59 p.m. 11
5:00 – 5:59 p.m. 12
6:00 – 6:59 p.m. 13
7:00 – 7:59 p.m. 14
8:00 – 8:59 p.m. 15
9:00 – 9:59 p.m. 16
UNSURE, BUT MORNING PEAK PERIOD (6:00 – 8:59 am) .17
UNSURE, BUT LATE MORNING (9:00 – 11:59 am) 18
UNSURE, BUT EARLY AFTERNOON (NOON – 3:59 pm).....19
UNSURE, BUT AFTRN PEAK PERIOD (4:00 – 6:59 pm) 20
UNSURE, BUT EVENING (7:00 pm OR LATER) 21
DK/CAN'T SAY.....99

A4. And what was the route number of the bus you were catching on that occasion? IF R IS UNSURE, ASK: Do you remember where you were taking the bus to?

BUS # .....|___|___|___|

SPECIFY: _____

SECTION B: USE OF TRANSIT

The first few questions are about your use of buses and the (A1 NAME) Transit Center.

B1. First I'd like to know how long you've been riding the Seattle - King County Metro buses.

JUST STARTED WITHIN THE LAST 4 WEEKS.....1
1-3 MONTHS AGO.....2
4-6 MONTHS AGO.....3
7-12 MONTHS AGO.....4
MORE THAN 12 MONTHS AGO.....5

B2. Next, I'd like to know how often you use the bus for your trips. When you think about all the trips you make in the Seattle region, for all purposes and by all means of travel (including walking), which one of the following answers best describes how much you use the buses? Would you say that you take the bus (READ ANSWERS)?

Hardly ever or you've only just started to ride buses 1
Only occasionally, for a small portion of your total travel 2
Regularly, but for only a small portion of your total travel 3
For about half of all the trips you make 4
For a substantial proportion of all the trips you make.....5
For more or less all your trips that are too far to walk 6
DK/CAN'T SAY.....9

B3. Please think about the number of times per week you board a bus at the (A1 NAME) Transit Center? Consider the total number of times per week you board a bus at this transit center, which may be more than the number of days. Would you say (READ ANSWERS)?

7 or more times a week 1
Between 4 and 6 times a week 2
1 to 3 times a week.....3
2 or 3 times a month.....4
Once a month or less often.....5
DK/CAN'T SAY.....9

B4. Thinking now about **just the last four weeks**, that is since (ENTER DAY/DATE 4 WEEKS AGO) in that time have you ever **transferred** from one bus to another at this transit center?

YES 1
NO 2
DK/CAN'T SAY.....9

B4. And in the **last four weeks**, have you ever **started** your overall bus trip from the (A1 NAME) Transit Center?

YES 1
NO 2
DK/CAN'T SAY.....9

B6. And have you ever **ended** your overall bus trip at the (A1 NAME) Transit Center in the last four weeks?

YES 1
NO 2
DK/CAN'T SAY.....9

B7. Please tell me all the bus route numbers that you have used to travel to or from the (A1 NAME) Transit Center in the last four weeks.

☐☐☐	☐☐☐	☐☐☐	☐☐☐	☐☐☐
☐☐☐	☐☐☐	☐☐☐	☐☐☐	☐☐☐

DK/CAN'T SAY.....000

B8. Next I want to find out about the times of day at which you have used the (A1 NAME) Transit Center in the last four weeks. During that time, have you ever left from or arrived at the transit center on a weekday morning before 9:00 a.m.?

YES 1
NO 2
DK/CAN'T SAY.....9

B9. And have you ever left from or arrived at the transit center on a weekday between 9:00 a.m. and 4:00 p.m. in the last four weeks?

YES 1
NO 2
DK/CAN'T SAY.....9

B10. How about weekday afternoons, between 4:00 p.m. and 7:00 p.m. — have you been there in the last four weeks at that time of day?

YES 1
NO 2
DK/CAN'T SAY.....9

B11. Next, have you ever left from or arrived at the transit center after 7:00 p.m. on a weekday in the last four weeks?

YES 1
NO 2
DK/CAN'T SAY.....9

B12. How about Saturdays — have you been there on any of the last four Saturdays?

YES 1
NO 2
DK/CAN'T SAY.....9

B13. How about Sundays — have you been there on any of the last four Sundays?

YES 1
NO 2
DK/CAN'T SAY.....9

B14. I'm now going to read you four different statements, and I'd like you to tell me which one of the four best describes what you know about the schedules of the buses you usually board at the (A1 NAME) Transit Center. Here they are. READ ANSWERS.

At the times I ride the buses they run frequently enough that I don't need to know the schedule 1
I know the exact schedule of the buses I take, at the times I usually ride.....2
I know approximately the schedule of the buses I take, at the times I usually ride 3
Because I don't know the schedule, I often need to wait a while.....4
DK/CAN'T SAY.....9

B15. How often do the buses seem to be off schedule? Would you say that happens (READ ANSWERS)?

Very infrequently.....1
Occasionally.....2
Often.....3
Almost always 4
DK/CAN'T SAY.....9

B16. At the (A1 NAME) Transit Center there are some video monitors (like a TV screen or a computer screen) and they give information about the buses that will leave in the next 20 minutes. Which one of these four statements best describes your use of those video monitors?

I've never seen the video monitors .....(SKIP TO B31)..1
I know they are there, but I rarely if ever look at them.....(SKIP TO B17)..2
I check them sometimes when I'm taking a bus from the Transit Center 3
I check the monitors every time I catch a bus from the Transit Center .....(SKIP TO B17)..4
DK/CAN'T SAY.....(SKIP TO B31)..9

A. Out of every ten times you take a bus from the (A1 NAME) Transit Center, on how many of those occasions would you estimate that you check the monitors? FOR ANSWER OF 0, PROBE: So you mean you almost never look at them? AND RECODE 2 in B15; FOR ANSWERS OF 10, PROBE: So you mean you almost always look at them? AND RECODE 3 IN B15.

ENTER NUMBER BETWEEN 1 AND 9.....

B17. When did you first notice the video information monitors at the (A1 NAME) Transit Center?

ONE WEEK AGO OR LESS 1
OVER ONE WEEK UP TO ONE MONTH (4 WEEKS) AGO.....2
OVER ONE MONTH UP TO TWO MONTHS (8 WEEKS) AGO.....3
OVER TWO MONTHS UP TO THREE MONTHS (13 WEEKS) AGO.....4
OVER THREE MONTHS UP TO SIX MONTHS AGO.....5
SIX MONTHS AGO OR LONGER.....6
DK/CAN'T SAY.....9

IF B16=2, SKIP TO B31.

B18. I'm going to read some reasons that people have mentioned when we've asked why they check the information monitors at the (A1 NAME) Transit Center. For each one, please tell me whether you've ever checked the monitors. READ OPTIONS.

	YES	NO/ CAN'T SAY
a. Out of curiosity, to see what it was.....	1	9
b. To choose which bus route to take.....	1	9
c. To find out which bay your bus would leave from...	1	9
d. To find out when your bus was **supposed** to leave	1	9
e. To find out when your bus actually **would** be leaving	1	9
f. To check the current time of day.....	1	9
g. No real reason, it's just something to do while waiting	1	9

IF ALL ANSWERS a-f ARE "9," PROBE THAT THERE WAS NEVER A REASON FOR R TO CHECK THE MONITORS. IF STILL NO REASON, SKIP TO B29.

IF ONLY ONE ANSWER a-f CODED "1," SKIP TO B19.

B19. And which **one** of those reasons is most likely to prompt you to check the video monitors these days? PROMPT WITH B17 YES ANSWERS AND CODE ONLY ONE.

- OUT OF CURIOSITY, TO SEE WHAT IT WAS 1
- TO CHOOSE WHICH BUS ROUTE TO TAKE 2
- TO FIND OUT WHICH BAY THE BUS WOULD LEAVE FROM 3
- TO FIND OUT WHEN THE BUS WAS SUPPOSED TO LEAVE 4
- TO FIND OUT WHEN THE BUS ACTUALLY WOULD BE LEAVING 5
- TO CHECK THE CURRENT TIME OF DAY 6
- DK/CAN'T SAY 9

IF B18d AND e ARE "9," SKIP TO B22.

B20. Which **one** of these four statements best describes how often you use the monitors to see if your bus is on time or not? That's the column on the monitor screen that's labeled "Departure Status." You use the monitor (READ ANSWERS).

- To check whether the bus is on time every time you catch a bus at the Transit Center 1
- To check what time the bus is going to leave only when you think it might be late 2
- To check whether the bus is on time only when you happen to go near one of the monitors 3
- Or, you rarely or never use the monitors to see whether your bus is on time 4
- NO INFORMATION AVAILABLE ON THE MONITOR FOR MY BUSES 5
- DK/CAN'T SAY 9

B21. In your experience, would you say the times you expect buses to leave based on the video monitors are (READ ANSWERS)?

- Accurate pretty much all of the time 1
- Accurate most of the time 2
- Accurate about half the time 3
- Inaccurate most of the time 4
- Inaccurate pretty much all of the time 5
- NO INFORMATION AVAILABLE ON THE MONITOR FOR MY BUSES 5
- DK/CAN'T SAY 9

B22. Next I'm going to mention each of the different types of information shown on the video monitors, and as I mention each one, I'd like you to tell me whether you find that particular feature very useful, somewhat useful, or not useful at all.

	VERY USEFUL	SOMEWHAT USEFUL	NOT USEFUL AT ALL	NO INFO AVAILABLE ON MONITOR FOR MY BUSES	DK/ CAN'T SAY
a. The route number and destination	1	2	3	4	9
b. The **scheduled** departure time	1	2	3	4	9
c. The bay number	1	2	3	4	9
d. The information about actual departure time	1	2	3	4	9
e. The current time of day	1	2	3	4	9
f. The red message at the bottom of the screen	1	2	3	4	9

B23. Since you first became aware of the information monitors at the (A1 NAME) Transit Center, have the monitors ever told you that the bus you were planning to catch would be seriously delayed, say by more than five minutes?

- YES 1
- NO ..... (SKIP TO B25) 2
- DK/CAN'T SAY ..... (SKIP TO B25) 9

B24. On the occasions when you've learned from the monitors that your bus would be at least five minutes late, what have you done then? CODE RESPONSES CONTINUING TO PROBE WITH "Anything else?" UNTIL NO FURTHER RESPONSES ARE FORTHCOMING.

JUST WAITED THERE FOR THE NEXT BUS TO COME ON THE SAME ROUTE.....01
CALLED AHEAD TO LET PEOPLE KNOW YOU MIGHT BE LATE.....02
DECIDED TO TAKE A DIFFERENT BUS ROUTE TO THE SAME DESTINATION.....03
DECIDED TO TAKE A DIFFERENT BUS ROUTE TO A DIFFERENT DESTINATION.....04
DECIDED TO GO BY A DIFFERENT MEANS OF TRANSPORT, SUCH AS A TAXI, CAR, ETC. 05
LEFT THE TRANSIT CENTER AND CAME BACK LATER.....06
OTHER .....(SPECIFY).....07
DK/CAN'T SAY.....99

SPECIFY: _____ ☐☐

B25. Here are some things that other people have mentioned doing when they learned from the video monitors that their bus was cancelled or running late. For each one, please tell me whether you can remember ever doing that specifically as a result of what you learned from the information monitors. ASK ONLY THOSE ITEMS NOT MENTIONED IN B23. Have you ever (READ OPTIONS)?

	YES	NO CAN'T SAY
a. Just waited there for the next bus to come on the same route?	1	9
b. Called ahead to let people know you might be late?	1	9
c. Decided to take a different bus route to the **same** destination?	1	9
d. Decided to take a different bus route to a **different** destination?	1	9
e. Decided to go by a different means of transport, such as a taxi, car, etc.?	1	9
f. Left the Transit Center and came back later?	1	9

IF B24 = 01 AND/OR B25a = 1, ASK B26.
OTHERS SKIP TO B27.

B26. When you waited at the (A1 NAME) Transit Center for the next bus to come along on your route, did the information you got from the video monitors (READ OPTIONS)?

Make you **more** worried about whether the bus would come.....1
Make you **less** worried.....2
Not affect your peace of mind one way or the other 3
DK/CAN"'T SAY 9

B27. Now please think back to the time before the information monitors were installed at the (A1 NAME) Transit Center. I'm again going to read some things people do when their bus is cancelled or delayed, and I'd like you to tell me whether you can remember ever doing that if your own bus didn't appear on time. First, have you ever (READ ANSWERS)?

	YES	NO CAN'T SAY
a. Asked a Metro employee about the bus?	1	9
b. Asked other people waiting about the bus?	1	9
c. Just waited there for the next bus on the same route?	1	9
d. Called ahead to let people know you might be late?	1	9
e. Decided to take a different bus route to the **same** destination?	1	9
f. Decided to take a different bus route to a **different** destination?	1	9
g. Decided to go by a different means of transport, such as a taxi, car, etc.?	1	9
h. Left the Transit Center and came back later?	1	9

IF B27a CODED 9, SKIP TO B29.

B28. You mentioned you've asked a Metro employee about a missing bus at least once in the past. What types of employees do you remember asking? CODE ALL THAT APPLY.

PEOPLE IN A DISPATCH/INFORMATION BOOTH.....1
DRIVERS OF OTHER BUSES.....2
OTHER METRO EMPLOYEES.....(SPECIFY).....3
DK/CAN'T SAY.....9

SPECIFY: _____ ☐☐

A. On those occasions, do you remember getting well-informed and accurate answers?

YES.....1
NO.....2
DK/CAN'T SAY.....9

B29. How could the information provided on the video monitors at the (A1 NAME) Transit Center be improved to make them more useful to you? CODE RESPONSES, CONTINUING TO PROBE WITH "Anything else?" UNTIL NO FURTHER RESPONSES ARE FORTHCOMING.

REDUCE THE NUMBER OF "NO INFORMATION AVAILABLE" REPORTS.....01
SHOW ROUTE NUMBERS THAT CURRENTLY AREN'T LISTED.....02
CONTINUE TO SHOW THE STATUS OF BUSES THAT HAVE LEFT IN THE LAST FEW MINUTES.....03
IMPROVE THE ACCURACY OF THE INFORMATION.....04
MORE MONITORS.....05
LARGER MONITORS, EASIER TO SEE/READ.....06
OTHER SUGGESTIONS.....(RECORD VERBATIM).....07
R HAS NO SUGGESTIONS.....99

RECORD VERBATIM: _____ ☐☐

B30. Please rate each of the following features of the video monitors as either "poor," "OK," or "good." READ OPTIONS.

	POOR	OK	GOOD	DK/ CAN'T SAY
a. How easy the screen is to read **close up**	1	2	3	9
b. How easy the screen is to read **from several feet away**	1	2	3	9
c. How easy the screen is to read when several people are there	1	2	3	9
d. The location of screens in the Transit Center	1	2	3	9

B31. I'm now going to read some suggestions that people have made about other ways for you to get information about the actual time – not just the scheduled time – that your bus will depart from the Transit Center. These ideas would not replace the monitors in the (A1 NAME) Transit Center; they would be in addition to them. As I read each one, please imagine how it would work and tell me whether you personally would find that idea useful, yes or no. First, (READ OPTIONS).

	YES	NO/ CAN'T SAY
a. a large changeable sign **outside** the transit center, that you could read from the street	1	9
b. video monitors with bus departure information in the nearby shopping mall	1	9
c. video monitors with bus departure information in the lobbies of major buildings nearby	1	9
d. a cable TV channel with the bus departure information from the transit center monitors	1	9
e. a World Wide Web-site with the bus departure information from the transit center monitors	1	9
f. a personal e-mail, phone call, or pager message when your bus is running more than 5 minutes late	1	9
g. a continuously updated phone line reporting delayed bus departure times in the next 30 minutes	1	9
h. more video monitors at the Transit Center itself, readable from more places	1	9

IF 0 OR 1 YES ANSWERS IN B31, SKIP TO B33.

B32. You said that (TOTAL YES RESPONSES) of those ideas would be useful to you. Which one of them would be **most** useful to you personally? DO NOT READ UNLESS R NEEDS HELP IN REMEMBERING WHAT WAS SELECTED IN B29. IF ONLY 2 YES ANSWERS IN B29, SKIP TO B31. And which of the ideas would be the second most useful to you? IF ONLY 3 YES ANSWERS IN B29, SKIP TO B31. And finally, which of the ideas would be the third most useful to you?

	FIRST CHOICE	SECOND CHOICE	THIRD CHOICE
a. a large changeable sign **outside** the transit center, that you could read from the street	1	2	3
b. video monitors with bus departure information in the nearby shopping mall	1	2	3
c. video monitors with bus departure information in the lobbies of major buildings nearby	1	2	3
d. a cable TV channel with the bus departure information from the transit center monitors	1	2	3
e. a World Wide Web-site with the bus departure information from the transit center monitors	1	2	3
f. a personal e-mail, phone call, or pager message when your bus is running more than 5 minutes late	1	2	3
g. a continuously updated phone line reporting delayed bus departure times in the next 30 minutes	1	2	3
h. more video monitors at the Transit Center itself, readable from more places	1	2	3

B33. Now I'm going to read several different things that people have told us. Some of these are statements about bus services, or about the (A1 NAME) Transit Center, others are about travel generally in the Seattle region, but some are just general opinions. For each one that I read, please tell me whether you agree strongly, agree, somewhat agree, neither agree nor disagree, disagree somewhat, or disagree strongly with that particular statement. Do you understand?

CLARIFY AS NECESSARY. READ EACH STATEMENT, OBTAINING A RESPONSE BEFORE PROCEEDING.

	AGREE STRONGLY	AGREE SOMEWHAT	NEITHER AGREE NOR DISAGREE	DISAGREE SOMEWHAT	DISAGREE STRONGLY
a. I use buses more now than I did six months ago	1	2	3	4	5
b. I get annoyed easily when my travel is delayed	1	2	3	4	5
c. I feel safer knowing when my next bus will leave	1	2	3	4	5
d. I do not like to have to plan ahead	1	2	3	4	5
e. I'm comfortable using high-tech equipment at home or at work	1	2	3	4	5

		AGREE STRONGLY	AGREE SOMEWHAT	NEITHER AGREE NOR DISAGREE	DISAGREE SOMEWHAT	DISAGREE STRONGLY
f.	Buses at the (A1 NAME) Transit Center have been less reliable since the new video monitors went in	1	2	3	4	5
g.	My bus service is so reliable that it does not matter much to have information about buses running late	1	2	3	4	5
h.	I worry a lot about being late	1	2	3	4	5
i.	I always keep up with the latest trends	1	2	3	4	5
j.	I'm concerned about my personal safety while waiting at the (A1 NAME) Transit Center	1	2	3	4	5
k.	I prefer to find my own way rather than ask for directions	1	2	3	4	5
l.	Since the new video monitors went in, my waiting time at the (A1 NAME) Transit Center has been reduced	1	2	3	4	5
m.	I do not like to take risks with new products and services	1	2	3	4	5
n.	Even if I cannot do anything about it, I'm more comfortable if I'm kept informed about bus service delays	1	2	3	4	5
o.	I like to be able to predict reliably just how long a trip will take me	1	2	3	4	5
p.	The new video monitors at the (A1 NAME) Transit Center are just cosmetic – what we really need is better transit service	1	2	3	4	5
q.	I often listen to radio or TV traffic reports before beginning my bus or car trips	1	2	3	4	5
r.	I seem to spend more time waiting for buses these days than I did six months ago	1	2	3	4	5
s.	When I need information, I like to be able to ask someone rather than rely on a computer	1	2	3	4	5
t.	As soon as I can, I'd like to switch to driving	1	2	3	4	5
u.	It is important that other people are able to contact me pretty much all the time	1	2	3	4	5
v.	Because I know when the bus will arrive, I sometimes wait at a safer spot in the Transit Center rather than at the departure bay	1	2	3	4	5
w.	Introducing the video monitors at the (A1 NAME) Transit Center has made me more satisfied with my decision to take the bus	1	2	3	4	5

B34. I'd like to find out what types of trips you make on the bus. Thinking about just the last four weeks, in that time have you traveled by bus to (READ OPTIONS)?

	YES	NO/ CAN'T SAY
a. go to or from work, school, or college?	1	9
b. make any other work-related trips, other than getting to or from work?	1	9
c. go shopping?	1	9
d. visit friends or relatives?	1	9
e. go to entertainment, sports, or recreation activities?	1	9
f. for personal business, like medical appointments, hairdressers, and so on?	1	9

B35. For your personal travel in the Seattle region, do you have a private vehicle such as a car, motorcycle, pick-up truck, or sports utility vehicle available for your use?

YES 1
NO .....(SKIP TO B38).....2
DK/CAN'T SAY.....(SKIP TO B38).....9

B36. Can you use that vehicle whenever you want to, or do you share it with other people and so can only use it sometimes?

R USES ANY TIME HE/SHE WANTS.....1
R CAN ONLY USE SOMETIMES 2
DK/CAN'T SAY.....9

B37. Please think back to the bus trip you were making on (DATE FROM A2) when our interviewer spoke to you at the (A1 NAME) Transit Center. For that particular trip, why did you take the bus rather than use your private vehicle? CODE RESPONSE. CONTINUE TO PROBE WITH "Anything else?" UNTIL NO FURTHER RESPONSES ARE FORTHCOMING.

RECORD VERBATIM: _____

_____

_____

_____ ☐☐

R **CAN'T DRIVE**, NO LICENSE.....01
PRIVATE VEHICLE **NOT AVAILABLE**, OR SOMEONE ELSE WAS USING 02
USING PRIVATE VEHICLE **COSTS TOO MUCH** (DRIVING COSTS, FUEL COSTS, PARKING COSTS) 03
DRIVING AND/OR PARKING **TAKES MORE TIME** THAN THE BUS 04
DRIVING TIME **MORE VARIABLE OR LESS DEPENDABLE** THAN THE BUS, **BUS MORE RELIABLE**.....05
DOESN'T LIKE DRIVING, OR DRIVING IN CONGESTED CONDITIONS, OR HEAVY TRAFFIC.....06
BUS MORE **COMFORTABLE,** LESS STRESSFUL, CAN DO OTHER THINGS WHILE TRAVELING (e.g., READ).....07
SPECIAL CONDITIONS THAT DAY (e.g., WEATHER, TRAFFIC DELAYS, ETC.).....(RECORD VERBATIM) 08
BUS TRAVEL **BETTER FOR SOCIETY,** LESS POLLUTION/CONGESTION, HELP THE ENVIRONMENT.....09
ALWAYS TAKES THE BUS FOR THAT TYPE OF TRIP.....10
OTHER REASONS.....(RECORD VERBATIM) 11
DK/CAN'T SAY.....99

B38. In an average month recently, how much in total have you had to pay in bus fares? Just count the amount coming out of **your own** pocket, not including anything paid for you by your employer. RECORD TO THE NEAREST DOLLAR, IGNORING ANY CENTS AMOUNT. PROBE ANY AMOUNTS GREATER THAN $65. Can you tell me how you calculated that amount? Does it seem right to you? IF R REPLIES "ZERO," PROBE: So you personally haven't paid anything?

BUS FARES.....$ ___

IF B2 = 1, SKIP TO B40.

B39. Within the last nine months, have any of the bus lines that you use most often had major changes to the schedules or to the routes?

YES 1
NO 2
DK/CAN'T SAY.....9

B40. Do you commute at least three days a week to work or to school or college?

YES 1
NO .....(SKIP TO C1).....2
DK/CAN'T SAY.....(SKIP TO C1).....9

B41. Which of these four statements best describes how flexible you can be in the times that you arrive and leave there? READ ANSWERS.

You have no flexibility at all in the times you have to be there 1
You can vary your starting and finishing times a little, but not by more than 15 minutes 2
You can vary your starting and finishing times somewhat, but not by more than 30 minutes 3
You're pretty much free to adjust your starting and finishing times as you like 4
DK/CAN'T SAY.....9

IF B16 = 1, 2, OR 9, SKIP TO C1.

B42. Have you changed the number of trips that you take by bus **as a result of the information provided by the video monitors**?

YES, I TAKE MORE TRIPS 1
YES, I TAKE FEWER TRIPS 2
NO CHANGE.....3
DK/CAN'T SAY.....9

SECTION C: GENERAL INFORMATION

C1. We're almost through, but I need to ask a few general questions about you and your household, for statistical purposes only. Please tell me when I reach the category that includes your age on your last birthday. READ ANSWERS.

18 to 25.....1
26 to 35.....2
36 to 45.....3
46 to 55.....4
56 to 65.....5
66 or older.....6
DK/WON'T SAY 9

C2. CODE WITHOUT ASKING IF POSSIBLE, BUT IF ANY DOUBT, ASK: Are you male or female?

MALE.....1
FEMALE.....2
DK/CAN'T SAY.....9

C3. What was the last level of school or college that you completed? PROBE IF NECESSARY FOR CORRECT CODING.

- GRADE SCHOOL (THROUGH GRADE 8) 1
- 1 TO 3 YEARS OF HIGH SCHOOL (GRADES 9 THROUGH 11) 2
- 4 YEARS OF HIGH SCHOOL (GRADE 12), OR GED 3
- 1 TO 3 YEARS OF COLLEGE, OR JUNIOR COLLEGE GRADUATE 4
- 4 YEARS OF COLLEGE, OR COLLEGE GRADUATE 5
- POSTGRADUATE WORK OR DEGREE 6
- DK/WON'T SAY 9

C4. **Including yourself,** how many people live in your household? Please tell me the total number of people. READ OPTIONS.

a. Aged 18 and over ..... ☐☐

b. And the total aged 17 or under ..... ☐☐

C5. Which of the following things do you personally use at least once a week, on average?

	YES	NO/CAN'T SAY
a. a computer at home	1	9
b. a computer at work or school	1	9
c. the internet (that is, external e-mail or the World Wide Web), accessed at home	1	9
d. the internet, accessed at work or school	1	9
e. a fax machine	1	9
f. an electronic navigational display unit, mounted in a private vehicle	1	9
g. cable or satellite TV	1	9

C6. And which of the following things do you carry with you outside your home at least ten times a month, on average?

	YES	NO/ CAN'T SAY
a. a portable phone (that is, a cellular, digital, or PCS phone)	1	9
b. a personal pager, or pager watch	1	9
c. a laptop computer **with a modem**	1	9
d. a laptop computer **with wireless communications**	1	9
e. a palmtop computer or "personal digital assistant" **with wireless communications**	1	9

IF C4a = 1, SKIP TO C11.

C7. Is yours the type of household where the members generally **pool** their incomes and their food expenses?

- YES 1
- NO ..... (SKIP TO C11) 2
- DK/CAN'T SAY ..... (SKIP TO C11) 9

C8. Finally, in 1998 what was the **total** annual income of your household, before taxes or other deductions from pay? Was that (READ ANSWERS)?

Less than $35,000 1
or $35,000 or higher ..... (SKIP TO C10) 2
DK/CAN'T SAY/WON'T SAY ..... (SKIP TO C10) 9

C9. Please tell me when I reach the category that includes your total household income last year. READ ANSWERS.

Less than $15,000 1
$15,000 to $24,999 2
$25,000 to $34,999 3
DK/CAN'T SAY/WON'T SAY 9

SKIP TO END.

C10. Please tell me when I reach the category that includes your total household income last year.

$35,000 to $49,999 1
$50,000 to $74,999 2
$75,000 to $99,999 3
$100,000 to $124,999 4
$125,000 to $149,999 5
$150,000 or more 6
DK/CAN'T SAY/WON'T SAY 9

SKIP TO END.

C11. Finally, in 1998, what was your personal **total** annual income, before taxes or other deductions from pay? Was that (READ ANSWERS)?

Less than $35,000 1
or $35,000 or higher ..... (SKIP TO C13) 2
DK/CAN'T SAY/WON'T SAY ..... (SKIP TO C13) 9

C12. Please tell me when I reach the category that includes your total personal income last year. READ ANSWERS.

Less than $15,000 1
$15,000 to $24,999 2
$25,000 to $34,999 3
DK/CAN'T SAY/WON'T SAY 9

SKIP TO END.

C13. Please tell me when I reach the category that includes your total personal income last year. READ ANSWERS.

$35,000 to $49,999 1
$50,000 to $74,999 2
$75,000 to $99,999 3
$100,000 to $124,999 4
$125,000 to $149,999 5
$150,000 or more 6
DK/CAN'T SAY/WON'T SAY 9

ENDING STATEMENT:

OK, those are all the questions I have to ask you today. I'd like to thank you for your time and cooperation; you've been very helpful.